Filling Gaps Where There are None: *Ex Post* Enforcement of RAND Commitments

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Motivation: Broadcom v. Qualcomm

- **Complaint (2006):** Qualcomm acquired monopoly power by inducing the SDO to adopt a standard that incorporated its patents by promising to license its patents on FRAND terms.

- **Finding:** “...a patent holder’s intentionally false promise to license essential proprietary technology on FRAND terms, ...is actionable anticompetitive conduct.”

  ⇒ Broadcom Corp. v. Qualcomm Inc., 501 F.3d 297, 314 (3d Cir. 2007)
Motivation: EC v. Rambus

- **Charge:** In 2007, Rambus abused its dominant position in the market for DRAM chips by engaging in “patent ambush” by intentionally concealing its patents and patent applications, which were relevant to an industry-wide DRAM standard, and then subsequently claiming exorbitant royalties on those patents.

- **Settlement:** In 2010, Rambus agrees to reduce maximum royalty from 3.5% to 1.5%.

- Commissioner Neelie Kroes commented: “...Abusive practices in standard setting can harm innovation and lead to higher prices for companies and consumers.”

Motivation: EC investigates Qualcomm

- **Investigation**: In 2007, “whether the royalties that Qualcomm has been charging since its patented technology became part of Europe’s 3G standard are unreasonably high.”

- The Commission stated: “The Qualcomm case has raised important issues about the pricing of technology after its adoption as part of an industry standard. In practice, such assessments may be very complex, and any antitrust enforcer has to be careful about overturning commercial agreements.”

Economic models of patent ambush

- **Patent ambush** (post-investment hold-up): Once a user (manufacturer) of a patented technology makes technology-specific investment, the manufacturer can be held up by the patent owner (innovator).

- Standard setting organizations provide for safeguards: Patent owners must commit to license their IP on “reasonable and nondiscriminatory” terms (RAND).

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<th>Innovation decision</th>
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<td>deception</td>
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<td>Froeb &amp; Ganglmair (2010)</td>
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<td>dependent on investment returns</td>
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Outline

Policy question: Can ex-post litigation help mediate transactions between creators and users of intellectual property?

Answer: Model of bilateral contracting between creators and users of IP featuring sequential investment and double-sided hold-up.

Result 1: Ex post litigation is sometimes better, sometimes worse than patent ambush.
⇒ Solves manufacturer’s hold-up but worsens innovator’s hold-up.

Result 2: Bilateral contracts dominate ex post litigation.
⇒ Solve manufacturer’s hold-up and mitigate innovator’s hold-up.

Result 3: Ex post litigation nullifies effects of contract.
⇒ Takes us from Result 2 back to Result 1.
Case 1: No contracts

Figure: Sequence of events for the case of patent ambush

- $t_1$: Innovator develops at cost $D$
- $t_2$: Manufacturer invests at cost $c(k)$
- Ex-post license negotiations
- $t_3$: Manufacturer adopts if $v(k) - p \geq v_0$

Under-investment by both parties

To protect herself against hold-up, manufacturer will under-invest. This causes further under-investment by the innovator.
Case 2: Option-to-license contracts

Figure: Sequence of events for the case of bilateral contracting

- **t1**: Innovator develops at cost $D$
- **Ex-ante license negotiations**
- **t2**: Manufacturer invests at cost $c(k)$
- **Ex-post license renegotiations**
- **t3**: Manufacturer adopts if $v(k) - p_e \geq v_0$

Under-investment by innovator only

A simple option-to-license contract restores the manufacturer’s incentive to invest. This indirectly increases the innovator’s investment return.

*Note*: This is the hypothetical license price a court would reference to determine whether an *ex post* price is “reasonable” (RAND).
Case 3: *Ex post* litigation without a contract

**RAND Enforcement**

1. The innovator violates his RAND commitment by demanding an *ex post* license fee that exceeds the hypothetical license price.
2. In case of a violation, the innovator is compelled to pay damages, equal to some multiple of the difference between the actual price and the RAND price.

**Proposition**

*Ex post* litigation solves the manufacturer’s hold-up problem but worsens the innovator’s hold-up problem.

Result 1: *Ex post* litigation is sometimes better than patent ambush (Case 1).
Result 2: Bilateral contracts (Case 2) dominate *ex post* litigation.
Case 4: *Ex post* litigation with a contract

Bargaining in the shadow of *ex post* litigation

*Ex post* litigation reduces the *ex ante* contract price.

The alternatives to agreement determine the terms of agreement, and *ex post* litigation improves the manufacturer’s alternative.

Proposition

Result 3: *Ex post* litigation (Case 4) nullifies effects of contract (Case 2).

Note: Litigation on top of a contract takes us back to litigation without a contract.
The law casts a dark shadow on ex ante contracting

_Deception v. anticipated hold-up:_ If a court cannot distinguish hold-up due to incomplete contracts from hold-up due to deception, then they can make things worse (Result 1).

- Was hold up in _EC v. Rambus_ was due to incomplete contracts or deception?
- _EC investigation of Qualcomm:_ “...any antitrust enforcer has to be careful about overturning commercial agreements.”

_How should courts define RAND:_ Even using an ex ante measure, as opposed to the court’s ex post measure, it is not clear that ex post litigation will make things better.
When does hold-up occur?

- Innovator develops for costs $D$ lower than license revenues $I^{PA}$.
- R&D breakdown if either the innovator (for $\beta = 0$) or the manufacturer (for $\beta = 1$) sets the license price ex-post.
- The innovator is best off for some intermediate value of $\beta$. He receives a smaller share of a much larger pie.
- Likewise for welfare $\mathcal{W}$.
Holdup vs. option-to-license contract

- The innovator develops if $D \leq I^C$.
- Compare innovation in Case 1 ($I^{PA}$) and Case 2 ($I^C$).
- Not surprisingly, bilateral price commitment solves the manufacturer’s hold-up problem and increases the likelihood of innovation.
- Because $k^*$ for any $\beta$, the innovator is best off when setting the price (for $\beta = 0$).
- Likewise for welfare $W$. 
Figure: Reduced extensive form of the innovator’s *ex-post* price offer
RAND solves manufacturer’s hold-up but deters innovation

- RAND enforcement solves the manufacturer’s hold-up problem.
- The innovator develops if $D \leq I^R$.
- Only for low $\beta$ (innovator has high bargaining power): RAND yields higher license revenues than patent ambush.
- Welfare $W$ under patent ambush is higher if $\beta$ is high and patent ambush is a minor problem.
\( \tilde{v}_0(\beta) \)

RAND enforcement dominates

Patent ambush dominates

(I)  

(II)  

(III)  

(IV)  

\( v_0^\text{max} \)